The myology of the different regions of the animal has been closely investigated, especially the rudimentary muscles of the paddle, which latter the authors have minutely examined.

The anatomy of the mouth, pharynx, and blowholes is described, and the mechanism by which the functions of respiration and deglutition are performed. In connexion with the larynx, a remarkable muscular pouch is mentioned as existing, which appendage is supposed by the authors to be accessory to the act of expiration, serving a somewhat similar office to that of the air-reservoir in a double-action bellows. Directly in front of the glottis there existed a peculiar hood-like fold of mucous membrane arranged in such a way as to allow of its being drawn over the orifice, and so prevent the entrance of all foreign substances into the respiratory tract during the act of deglutition.

The tongue was found fixed, as far as its tip, by a thick frænum. The lateral walls of the submaxillary cavity were thrown into folds, thereby admitting of considerable distention, this arrangement being peculiarly adapted to the feeding requirements of the animal. The number of baleen plates found in the specimen was 280 on each side.

The muscles for acting on the blowholes were arranged in three strata, the superficial and deepest layers being used in opening, and the intermediate one for closing the nasal canals.

The anatomy of the eye and ear is fully described in the original paper, together with that of the digestive, nervous, and vascular systems; in connexion with this last, remarkable vascular retia were found, situated in the axillary, submaxillary and cervical regions.

In the preceding brief abstract the writers have endeavoured to give an outline of their numerous observations on the anatomy of this Cetacean, believing that it presents many features of novelty and interest not hitherto recorded.

XV. "On the Distribution of the Fibres in the Muscular Tunics of the Stomach in Man and other Mammalia." By James Bell Pettigrew, M.D. Communicated by George Busk, Esq. Received June 20, 1867.

(Abstract.)

The author of the present memoir has examined in succession the stomach of the several domestic animals, the Whale, Porpoise, Bear, Puma, Sloth, Cœbus Monkey, Howling Monkey, Orang-Otang, Chimpanzee, and particularly Man, both in the fœtal and adult state.

The plan adopted in the examination was to distend the viscus immediately after its removal from the body with water or air, and view it as a transparent object; to blanch the stomach by maceration, and distend it with plaster of Paris, tinted with blue, or to stain the parietes with carmine and inject with white plaster, the object in either case

The Royal Society is collaborating with JSTOR to digitize, preserve, and extend access to *Proceedings of the Royal Society of London.* www.jstor.org

being to throw the delicate fibres into strong relief. By adopting those methods, the author has been able to show that the arrangement of the fibres in the stomach remarkably resembles that found in the heart* and bladder†. This is particularly the case in the human stomach, where the fibres are most highly differentiated. In it the fibres pursue complicated, but well-marked directions; the most external and most internal fibres maintaining a more or less longitudinal course, the deeper or more central ones becoming more and more oblique as the centre of the parietes is reached.

The fibres cross each other with great regularity, both from without and from within, the longitudinal intersecting the very oblique at nearly right angles, the slightly oblique and oblique at more acute angles. The slightly oblique, oblique and very oblique fibres are spiral in their nature, and form, or tend to form, figure-of-8 loops. These loops are directed towards the greater and lesser curvatures of the stomach, but are also traceable on the great cul-de-sac or fundus, and on the lesser cul-de-sac or antrum pylori. As a result of the looped distribution of the fibres, the root of the œsophagus and the pylorus are invested with oblique and very oblique spiral fibres, arranged symmetrically in two sets. These fibres pursue opposite directions, and surround the entrance into and exit from the stomach after the manner of sphincters. The crossing and looping of the fibres extends also to the body of the viscus, and shows that the so-called circular layer is in reality composed of very oblique spiral fibres, intersecting at very obtuse angles.

The fibres are arranged in different planes or strata, and may be divided into external and internal sets. These are united to each other by a mutual interchange of fibrous filaments; and the fibres of the several strata interweave to a slight extent, so that the term layer must be used in a restricted sense. The layers are indicated by the prevailing direction of the fibres, and are something like seven in number, three external and three internal, with an intermediate or central layer between.

The fibres having the same direction, are in some instances strongly developed at one part of their course, and feebly at another. They even become gradually attenuated, until they are no longer discernible. The muscular coat of the stomach is thickest towards the pylorus‡ and root of the œsophagus; then along the lesser curvature on either side of the mesial line; then along the greater curvature. It is thinnest on the anterior and posterior surfaces, and towards the cardiac end.

---

* "On the Arrangement of the Muscular Fibres in the Ventricles of the Vertebrate Heart, with Physiological Remarks," by the author, Phil. Trans. part 3. 1864, p. 445.

† "On the Muscular Arrangements of the Bladder and Prostate, and the manner in which the Ureters and Urethra are closed," by the author, Phil. Trans. part 1. 1867.

‡ In the stomach of the Bear the walls of the antrum pylori are fully a quarter of an inch in thickness.

The gradual diminution in the thickness of the coat of the stomach is occasioned by the fibres of one layer or stratum radiating and becoming more and more delicate, while those of another and opposite layer converge and become stronger and stronger; it usually happening that the stronger fibres supplement the weaker ones, so that the parietes, although not of uniform thickness, are not suddenly strong and weak in parts, but graduated. The only sudden thickening occurs in the shape of two ridges which run along the lesser curvature about an inch apart. The ridges in question are very distinct in the stomach of the Cat. They can also be detected in a modified form in the stomach of the Monkey and of Man.

The dissections on which the above communication is based are preserved in the Museum of the Royal College of Surgeons of England; and the paper is illustrated by numerous original figures showing the distribution of the fibres in the stomachs of the Herbivora, Carnivora, and Omnivora.

XVI. "On a Self-acting Apparatus for multiplying and maintaining Electric Charges, with applications to illustrate the Voltaic Theory." By Sir W. Thomson, F.R.S., Glasgow University. Received June 19, 1867.

In explaining the water-dropping collector for atmospheric electricity, in a lecture in the Royal Institution in 1860, I pointed out how, by disinsulating the water-jar and collecting the drops in an insulated vessel, a self-acting electric condenser is obtained. If, owing to electrified bodies in the neighbourhood, the potential in the air round the place where the stream breaks into drops is positive, the drops fall away negatively electrified; or *vice versâ*, if the air potential is negative, the drops fall away positively electrified. The stream of water descending does not in any way detract from the charges of the electrified bodies to which its electric action is due, provided always these bodies are kept properly insulated; but by the dynamical energy of fluid-motion, and work performed by gravity upon the descending drops, electricity may be unceasingly produced on the same principle as by the electrophorus. But, as in the electrophorus, there was no provision except good insulation for maintaining the charge of the electrified body or bodies from which the induction originates. This want is supplied by the following reciprocal arrangement, in which the body charged by the drops of water is made the inductor for another stream, the drops from which in their turn keep up the charge of the inductor of the first.

To stems connected with the inside coatings of two Leyden phials are connected metal pieces, which, to avoid circumlocution, I shall call inductors and receivers. Each stem bears an inductor and a receiver